Agency for Healthcare Research and Quality
Advancing Excellence in Health Care

NATIONAL QUALITY MEASURES CLEARINGHOUSE

General

Title

Acute stroke: mortality rate.

Source(s)

AHRQ quality indicators. Guide to inpatient quality indicators: quality of care in hospitals - volume, mortality, and utilization [version 3.1]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2007 Mar 12. 91 p.

AHRQ quality indicators. Inpatient quality indicators: technical specifications [version 4.2]. IQI #17 acute stroke mortality rate. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2010 Sep. 1 p.

Measure Domain

Primary Measure Domain

Outcome

The validity of measures depends on how they are built. By examining the key building blocks of a measure, you can assess its validity for your purpose. For more information, visit the Measure Validity page.

Secondary Measure Domain

Does not apply to this measure

Brief Abstract

Description

This measure is used to assess the number of deaths per 100 discharges with principal diagnosis code of stroke.

Some stroke care occurs in an outpatient setting, and selection bias may be a problem for this indicator. In addition, 30-day mortality may be somewhat different than in-hospital mortality, leading to information bias. Risk adjustment for clinical factors (or at a minimum 3M™ All-Patient Refined Diagnosis-Related Groups [APR-DRGs]) is recommended. Coding appears suboptimal for acute stroke and may lead

to bias.

Rationale

About 30% of personal health care expenditures in the United States go towards hospital care, and the rate of growth in spending for hospital services has only recently leveled out after several years of increases following a half a decade of declining growth. Simultaneously, concerns about the quality of health care services have reached a crescendo with the Institute of Medicine's series of reports describing the problem of medical errors and the need for a complete restructuring of the health care system to improve the quality of care. Policymakers, employers, and consumers have made the quality of care in U.S. hospitals a top priority and have voiced the need to assess, monitor, track, and improve the quality of inpatient care.

Quality treatment for acute stroke must be timely and efficient to prevent potentially fatal brain tissue death, and patients may not present until after the fragile window of time has passed. Better processes of care may reduce short-term mortality, which represents better quality.

Note:

The following caveats were identified from the literature review for the "Acute Stroke Mortality Rate" indicator:

Selection bias[b]: This results when a substantial percentage of care for a condition is provided in the outpatient setting, so the subset of inpatient cases may be unrepresentative. Examination of outpatient care or emergency care data may help to reduce this in these cases.
Information bias[a]: This indicator is based on information available in hospital discharge data sets, but some missing information may actually be important to evaluating the outcomes of hospital care. Examination of missing information may help to improve indicator performance in these cases.
Confounding bias[b]: Patient characteristics may substantially affect the performance of the indicator; risk adjustment is recommended.

Refer to the original measure documentation for further details.

a - The concern is theoretical or suggested, but no specific evidence was found in the literature.

b - Indicates that the concern has been demonstrated in the literature.

Primary Clinical Component

Acute stroke; mortality

Denominator Description

All discharges, age 18 years and older, with a principal diagnosis code for stroke

Exclude cases:

Missing discharge disposition, gender, age, quarter, year, or principal diagnosis
Transferring to another short-term hospital
Major Diagnostic Category (MDC) 14 (pregnancy, childbirth, and puerperium)

Note: Refer to the Technical Specifications document for specific International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) codes.

Numerator Description

Number of deaths among cases meeting the inclusion and exclusion rules for the denominator

Evidence Supporting the Measure

Evidence Supporting the Criteria of Quality

Evidence Supporting the Criterion of Quality

A clinical practice guideline or other peer-reviewed synthesis of the clinical evidence

One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal

Evidence Supporting Need for the Measure

Need for the Measure

Variation in quality for the performance measured

Evidence Supporting Need for the Measure

AHRQ quality indicators. Guide to inpatient quality indicators: quality of care in hospitals - volume, mortality, and utilization [version 3.1]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2007 Mar 12. 91 p.

State of Use of the Measure

State of Use

Current routine use

Current Use

External oversight/State government program

Internal quality improvement

Quality of care research

Application of Measure in its Current Use

Care Setting

Hospitals

Professionals Responsible for Health Care

Physicians

Lowest Level of Health Care Delivery Addressed

Single Health Care Delivery Organizations

Target Population Age

Age greater than or equal to 18 years

Target Population Gender

Either male or female

Stratification by Vulnerable Populations

Unspecified

Characteristics of the Primary Clinical Component

Incidence/Prevalence

Unspecified

Association with Vulnerable Populations

Unspecified

Burden of Illness

Stroke remains the third leading cause of death in the United States. However, hospital care has a relatively modest impact on patient survival, and most stroke deaths occur after the initial acute hospitalization. According to the literature, only 10% to 15% of stroke patients die during hospitalization.

Evidence for Burden of Illness

Brown RD, Whisnant JP, Sicks JD, O'Fallon WM, Wiebers DO. Stroke incidence, prevalence, and survival: secular trends in Rochester, Minnesota, through 1989. Stroke. 1996 Mar;27(3):373-80. PubMed

Hoyert DL, Heron MP, Murphy SL, Kung HC. Deaths: final data for 2003. Natl Vital Stat Rep. 2006 Apr 19;54(13):1-120. PubMed

Utilization

Unspecified

Costs

Unspecified

Institute of Medicine (IOM) Healthcare Quality Report Categories

IOM Care Need

Getting Better

IOM Domain

Effectiveness

Data Collection for the Measure

Case Finding

Users of care only

Description of Case Finding

Discharges, age 18 years and older, with acute stroke (see the "Denominator Inclusions/Exclusions" field)

Denominator Sampling Frame

Patients associated with provider

Denominator Inclusions/Exclusions

Inclusions

All discharges, age 18 years and older, with a principal diagnosis code for stroke

Note: Refer to the Technical Specifications document for specific International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) codes.

Exclusions

Exclude cases:

- Missing discharge disposition, gender, age, quarter, year, or principal diagnosis
- Transferring to another short-term hospital
- Major Diagnostic Category (MDC) 14 (pregnancy, childbirth, and puerperium)

Relationship of Denominator to Numerator

All cases in the denominator are equally eligible to appear in the numerator

Denominator (Index) Event

Clinical Condition

Institutionalization

Denominator Time Window

Time window brackets index event

Numerator Inclusions/Exclusions

Inclusions
Number of deaths among cases meeting the inclusion and exclusion rules for the denominator

Exclusions
Unspecified

Measure Results Under Control of Health Care Professionals, Organizations and/or Policymakers

The measure results are somewhat or substantially under the control of the health care professionals, organizations and/or policymakers to whom the measure applies.

Numerator Time Window

Institutionalization

Data Source

Administrative data

Level of Determination of Quality

Not Individual Case

Outcome Type

Clinical Outcome

Pre-existing Instrument Used

Unspecified

Computation of the Measure

Scoring

Rate

Interpretation of Score

Better quality is associated with a lower score

Allowance for Patient Factors

Analysis by subgroup (stratification on patient factors, geographic factors, etc.)

Case-mix adjustment

Risk adjustment method widely or commercially available

Description of Allowance for Patient Factors

Observed (raw) rates may be stratified by hospitals, age groups, race/ethnicity categories, sex, and payer categories.

Risk adjustment of the data is recommended using, at minimum, age, sex, and 3M™ All-Patient Refined Diagnosis-Related Groups (APR-DRGs)*.

Application of multivariate signal extraction (MSX) to smooth risk adjusted rates is also recommended.

*Note: Information on the 3M™ APR-DRG system is available at http://solutions.3m.com/wps/portal/3M/en_US/3M_Health_Information_Systems/HIS/Products/APRDRG_Software/.

Standard of Comparison

External comparison at a point in time

External comparison of time trends

Internal time comparison

Evaluation of Measure Properties

Extent of Measure Testing

Each potential quality indicator was evaluated against the following six criteria, which were considered essential for determining the reliability and validity of a quality indicator: face validity, precision, minimum bias, construct validity, fosters real quality improvement, and application. The project team searched Medline for articles relating to each of these six areas of evaluation. Additionally, extensive empirical testing of all potential indicators was conducted using the 1995-97 Healthcare Cost and Utilization Project (HCUP) State Inpatient Databases (SID) and Nationwide Inpatient Sample (NIS) to determine precision, bias, and construct validity. Table 2 in the original measure documentation summarizes the results of the literature review and empirical evaluations on the Inpatient Quality Indicators. Refer to the original measure documentation for details.

Evidence for Reliability/Validity Testing

AHRQ quality indicators. Guide to inpatient quality indicators: quality of care in hospitals - volume, mortality, and utilization [version 3.1]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2007 Mar 12. 91 p.

Identifying Information

Original Title

IQI #17 acute stroke mortality rate.

Measure Collection Name

Agency for Healthcare Research and Quality (AHRQ) Quality Indicators

Measure Set Name

Inpatient Quality Indicators

Submitter

Agency for Healthcare Research and Quality - Federal Government Agency [U.S.]

Developer

Agency for Healthcare Research and Quality - Federal Government Agency [U.S.]

Funding Source(s)

Agency for Healthcare Research and Quality (AHRQ)

Composition of the Group that Developed the Measure

The Agency for Healthcare Research and Quality (AHRQ) Quality Indicators are in the public domain and the specifications come from multiple sources, including the published and unpublished literature, users, researchers, and other organizations. AHRQ as an agency is responsible for the content of the indicators.

Financial Disclosures/Other Potential Conflicts of Interest

None

Endorser

National Quality Forum - None

Included in

Hospital Quality Alliance

Adaptation

Measure was not adapted from another source.

Release Date

2002 Jun

Revision Date

2010 Sep

Measure Status

This is the current release of the measure.

This measure updates previous versions:

AHRQ quality indicators. Guide to inpatient quality indicators: quality of care in hospitals -- volume, mortality, and utilization [version 3.0]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2006 Feb 20. 99 p.
AHRQ quality indicators. Inpatient quality indicators: technical specifications [version 4.1]. IQI #17 acute stroke mortality rate. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2009 Dec 1. 1 p.

Source(s)

AHRQ quality indicators. Guide to inpatient quality indicators: quality of care in hospitals - volume, mortality, and utilization [version 3.1]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2007 Mar 12. 91 p.

AHRQ quality indicators. Inpatient quality indicators: technical specifications [version 4.2]. IQI #17 acute stroke mortality rate. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2010 Sep. 1 p.

Measure Availability

The individual measure, "IQI #17 Acute Stroke Mortality Rate," is published in "AHRQ Quality Indicators. Guide to Inpatient Quality Indicators: Quality of Care in Hospitals -- Volume, Mortality, and Utilization" and "AHRQ Quality Indicators. Inpatient Quality Indicators: Technical Specifications." These documents are available in Portable Document Format (PDF) from the Inpatient Quality Indicators Resources page at the Agency for Healthcare Research and Quality (AHRQ) Quality Indicators Web site.

For more information, please contact the QI Support Team at support@qualityindicators.ahrq.gov.

Companion Documents

The following are available:

AHRQ quality indicators. Inpatient quality indicators: software documentation, SAS [version 4.2]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2010 Sep. 41 p. This document is available in Portable Document Format (PDF) from the Agency for Healthcare Research and Quality (AHRQ) Quality Indicators Web site.
AHRQ quality indicators. Software documentation: Windows [version 4.1a]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2010 Jul 2. 97 p. This document is available in PDF from the AHRQ Quality Indicators Web site.
AHRQ quality indicators. Inpatient quality indicators composite measure workgroup. Final report. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2008 Mar. various p. This document is available in PDF from the AHRQ Quality Indicators Web site.
UCSF-Stanford Evidence-based Practice Center. Davies GM, Geppert J, McClellan M, et al. Refinement of the HCUP quality indicators. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2001 May. 24 p. (Technical review; no. 4). This document is available in PDF from the AHRQ Quality

Indicators Web site .
AHRQ quality indicator. Comparative data for the IQI based on the 2008 Nationwide Inpatient Sample (NIS) [version 4.1b]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2010 Sep. 20 p. This document is available in PDF from the AHRQ Quality Indicators Web site .
AHRQ quality indicator. Risk adjustment coefficients for the IQI [version 4.2]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2010 Sep. 20 p. This document is available in PDF from the AHRQ Quality Indicators Web site .
AHRQ quality indicators. Composite measures user guide for the inpatient quality indicators (IQI) [version 4.2]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2010 Sep. 6 p. This document is available in PDF from the AHRQ Quality Indicators Web site .
HCUPnet: a tool for identifying, tracking, and analyzing national hospital statistics. [Web site]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); [accessed 2011 May 24]. HCUPnet is available from the AHRQ Web site . See the related QualityTools summary.

NQMC Status

This NQMC summary was completed by ECRI on December 4, 2002. The information was verified by the Agency for Healthcare Research and Quality on December 26, 2002. This NQMC summary was updated by ECRI on April 7, 2004, August 19, 2004, and March 4, 2005. The information was verified by the measure developer on April 22, 2005. This NQMC summary was updated by ECRI Institute on August 17, 2006, on May 29, 2007, on October 20, 2008 and again on August 27, 2010. This NQMC summary was reviewed and edited by ECRI on July 13, 2011.

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